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IN THE CLAIMS:

1. (Previously presented) A device, comprising a housing holding a sensor, said housing having an inner surface, said inner surface having an inner-surface-inside dimension, said sensor including a coil and a captive core, wherein said coil has a coil inside diameter, wherein an electrical measurement of said coil provides information about at least one from the group including displacement of said captive core and velocity of said captive core, further wherein said coil has an axis extending in a first direction, wherein said housing has a minimum outside dimension that is less than 3.00 mm when measured perpendicular to said first direction, wherein said housing further comprises a support for said captive core, wherein said housing inner-surface-inside dimension is greater than said coil inside diameter, wherein said support includes a first bearing and a second bearing, wherein said captive core has a stroke length, wherein said captive core has a first length of contact with said first bearing, wherein said captive core has a second length of contact with said second bearing, wherein said first length of contact is less than said stroke length and wherein said second length of contact is less than said stroke length, wherein said second bearing has a second-bearing-outside diameter that is greater than said coil inside diameter.

2. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 2.50 mm when measured perpendicular to said first direction.

3. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 2.00 mm when measured perpendicular to said first direction.

4. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 1.80 mm when measured perpendicular to said first direction.

5. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 1.60 mm when measured perpendicular to said first direction.

6. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 1.40 mm when measured perpendicular to said first direction.

7. (Original) A device as recited in claim 1, wherein said captive core extends into said coil.

8. (Previously presented) A device as recited in claim 1, wherein said captive core has a first portion having a first diameter, wherein said captive core further includes a second portion having a diameter greater than said first diameter for retaining said core within said housing.

9. (Original) A device as recited in claim 8, wherein said first bearing is connected to said housing, wherein said core slides within a hole in said first bearing.

10. (Previously presented) A device as recited in claim 8, wherein said second bearing is mechanically mounted to at least one from the group including said coil and said housing, wherein said core slides within a first hole in said first bearing and wherein said core slides within a second hole in said second bearing.

11. (Original) A device as recited in claim 8, wherein said second bearing is integral with said second portion and mechanically connected to said core, wherein said second bearing moves with said core.

12. (Original) A device as recited in claim 11, wherein said first bearing and said second bearing are jewel bearings.

13. (Original) A device as recited in claim 11, wherein said captive core comprises steel, stainless steel, titanium, aluminum, plastic, or a super-elastic material.

14. (Original) An sensor as recited in claim 13, wherein said superelastic material comprises nitinol.

15. (Original) A device as recited in claim 1, wherein said displacement or velocity sensor comprises an inductive sensor or an eddy current sensor.

16. (Original) A device as recited in claim 15, wherein said inductive sensor or said eddy current sensor is a one-coil device.

17. (Original) A device as recited in claim 15, wherein said inductive sensor or said eddy current sensor is a two-coil device.

18. (Original) A device as recited in claim 15, wherein said inductive sensor or said eddy current sensor is a three-coil device.

19. (Original) A device as recited in claim 1, wherein said sensor further comprises a spring to provide a return force to said core.

20. (Original) A device as recited in claim 19, wherein said core extends through said spring and into said coil.

21. (Original) A device as recited in claim 1, wherein said core includes a ferromagnetic material.

22. (Original) A device as recited in claim 21, wherein said ferromagnetic portion comprises iron, nickel, ferrite, or steel.

23. (Original) A device as recited in claim 1, wherein said core further comprises a contact point for making contact with an object to be measured, wherein said contact point is made of a hard material that resists wear.

24. (Original) A device as recited in claim 23, wherein said hard material comprises alumina, ruby, sapphire or hardened steel.

25. (Previously presented) A device as recited in claim 19, wherein said core further comprises a core stop to capture said core within said housing, wherein said core stop further limits extension of said spring.

26. (Previously presented) A device as recited in claim 25, wherein said housing has a housing inside diameter, and wherein said core stop is sized to have an outside diameter approximately equal to said housing inside diameter to provide a bearing function for guiding said core.

27. (Original) A device as recited in claim 1, further comprising lead wires electrically connected to said coil and extending to a circuit.

28. (Previously presented) A device for providing displacement information, comprising a housing having an inner surface, said inner surface having an inner-surface-inside dimension, said housing holding a displacement sensor and a guidance mechanism, said displacement sensor including a coil and a captive core, said coil having a coil inside diameter, said captive core having a core-outside dimension, wherein said guidance mechanism comprises a first bearing and a second bearing for guiding said core, wherein said first bearing is connected to said housing, wherein said first bearing has an axial hole having an axial-hole dimension about equal to said core-outside dimension, wherein said core slidably extends through said axial hole, wherein said second bearing has a second-bearing-outside dimension about equal to said inner-surface-inside dimension, wherein said guidance mechanism is for resisting lateral movement of said core while allowing axial movement of said core into and out of said coil, wherein said inner-surface-inside dimension is greater than said coil inside diameter, wherein said captive core has a stroke length, wherein said captive core has a first length of contact with said first bearing, wherein said captive core has a second length of contact with said second bearing, wherein said first length of contact is less than said stroke length and wherein said second length of contact is less than said stroke length.

29. (Original) A device as recited in claim 28, wherein said second bearing is connected to said captive core.

30. (Previously presented) A device as recited in claim 28, wherein said second bearing is connected to said housing .

31. (Previously presented) A device as recited in claim 28, wherein said second bearing is connected to said coil.

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33. (Original) A device as recited in claim 28, wherein said coil has an axis extending in a first direction, wherein said housing has a housing outside dimension, wherein said housing has a minimum outside dimension that is less than 3.00 mm when measured perpendicular to said first direction.

34. (Original) A device as recited in claim 28, further comprising a spring for spring loading said core.

35. (Currently amended) A system for providing displacement or velocity information, comprising an array of sensors, each said sensor capable of providing a measurement of at least one from the group consisting of displacement and velocity, wherein said sensors are on center to center spacing of less than 3mm, wherein each said sensor includes a housing holding a coil, a captive core, and a ~~bearing~~ plurality of bearings, wherein said bearings are for supporting said captive core, further wherein said coil has an axis extending in a first direction, wherein said coil has a coil inside diameter, wherein said captive core extends into said coil, wherein each said bearing has a bearing outside diameter~~, wherein said bearing outside diameter~~ that is greater than said coil inside diameter, wherein said captive core has a stroke length, wherein each said bearing has a length-of-contact in said first direction with a surface capable of movement in said first direction relative to said bearing that is less than said stroke length.

36. (Previously presented) A device as recited in claim 10, wherein said core extends out from said housing from said first bearing, wherein said second bearing is spaced a distance from said first bearing to provide said resistance to lateral forces on said core where said core extends from said housing while allowing free axial movement of said core.

37. (New) A device as recited in claim 1, wherein said captive core comprises a super-elastic material.

38. (New) An sensor as recited in claim 37, wherein said superelastic material comprises nitinol.

39. (New) A device as recited in claim 1, wherein said first bearing includes a jewel bearing and wherein said second bearing includes a jewel bearing.

40. (New) A device as recited in claim 28, wherein said captive core comprises a super-elastic material.

41. (New) An sensor as recited in claim 40, wherein said superelastic material comprises nitinol.

42. (New) A device as recited in claim 28, wherein said first bearing includes a jewel bearing and wherein said second bearing includes a jewel bearing.

43. (New) A device as recited in claim 35, wherein said captive core comprises a super-elastic material.

44. (New) An sensor as recited in claim 43, wherein said superelastic material comprises nitinol.

45. (New) A device as recited in claim 35, wherein each of said plurality of bearings includes a jewel bearing.

46. (New) A device as recited in claim 35, wherein said captive core comprises a super-elastic material.

47. (New) An sensor as recited in claim 46, wherein said superelastic material comprises nitinol.

48. (New) A device, comprising sensor capable of providing a measurement of at least one from the group consisting of displacement and velocity, wherein said sensor includes a housing holding coil, a captive core, and a plurality of bearings, wherein said bearings are for supporting said captive core, further wherein said coil has an axis extending in a first direction, wherein said coil has a coil inside diameter, wherein each said bearing has a bearing outside diameter that is greater than said coil inside diameter, wherein said captive core has a stroke length, wherein each said bearing has a length-of-contact in said first direction with a surface capable of movement in said first direction relative to said bearing that is less than said stroke length.

49. (New) A device as recited in claim 48, wherein each of said plurality of bearings includes a jewel bearing.

50. (New) A device as recited in claim 48, wherein said captive core comprises a super-elastic material.

51. (New) An sensor as recited in claim 50, wherein said superelastic material comprises nitinol.

52. (New) A device as recited in claim 48, wherein said sensor further comprises a spring to provide a return force to said captive core.